PEACE/WILLISTON
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COMPENSATION
PROGRAM

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Fish Habitat Enhancement Potential And Stocking Assessment Of Dina Lake (#2)

A. R. McLean and A. R. Langston
1991

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The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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Author(s): Allister R. McLean[1] and Arne Langston[1]
Address(es): [1] Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave., 3rd Floor Prince George, B.C. V2L 3H9

DINA LAKE #2

WATERSHED: Parsnip River

DATE OF SURVEY: June 20. 21. 1991

FIELD CREW LEADER: A.R. McLean

FIELD ASSISTANT: A.R. Langston

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FISH AND WILDLIFE BRANCH

REPORT PREPARED BY: A.R. McLean/A.R. Langston

Lake: **DINA #2**

INTRODUCTION

A standard fisheries baseline reconnaissance of Dina Lake #2 was carried out by the Fish and Wildlife Branch (Prince George) in June of 1970 and 1977. The reports (data sheets) are on file at the Ministry of Environment, Fish and Wildlife Branch, Prince George.

Dina Lake #2 has been stocked with brook trout since 1984 (table #1).

Dina Lake #2 (Plate #1) was investigated in June of 1991 by the Peace Fisheries Compensation Program to identify potential fisheries enhancement projects and to determine if alterations to the current stocking program are necessary.

STOCKING HISTORY

TABLE 1
DINA LAKE #2 STOCKING HISTORY

Year	Species	Number	Size (grams)	Stage	Stock
1991	brook trout	10,000	3.1	fry	Aylmer
1990	brook trout	5,000	4.2	fry	Aylmer
1989	brook trout	10,000	2.5	fry	Aylmer
1988	brook trout	5,000	2.7	fry	Aylmer
1987	brook trout	5,000	2.0	fry	Aylmer
1984	brook trout	10,000	3.8	fry	Aylmer

LOCATION

Location: 25 km north northwest of Mackenzie
Elevation: 716 m +/-
Latitude/Longitude: 55^{0}32'12":123°17'36" U.T.M.: 10.4815.61544
Management Unit: 7-30 N.T.S. Map No.: 93-0/11

Drainage: Unnamed C.-->Dina Lake #1

Plate 1: Panoramic view of Dina Lake #2 looking northeast, taken from middle of lake.

Lake: **DINA #2**

METHODS

Two sinking monofilament gill nets (6 and 18 hour sets) and two minnow traps (both 25 hour sets) were set to determine relative abundance and identification of fish species in Dina Lake #2 (See Appendix 1 for net set details) (See figure 1 for net set locations).

Brook trout were sampled for length, weight, sex, maturity, stomach contents and parasite/disease presence (Appendix 2). Scale samples were collected for age determination. General appearance of the brook trout was recorded through visual analysis. The total catch and size range of coarse fish species captured during the investigation was also recorded.

The fisheries enhancement potential of any inlets or outlets was determined through visual observation and recording of physical data, using standard methodologies outlined in the Fish/Habitat Inventory and Information Program (1987 Stream Survey Field Guide).

On site anglers were interviewed opportunistically. Salmonid catch per unit effort information was recorded from these anglers and angling undertaken by program staff.

The benchmark set during the initial study (1970) was located (figure 1). Any change in water level was measured using an eslon tape, in combination with a abney level.

Photo documentation of the investigation was also completed (see figure 1 for photo locations).

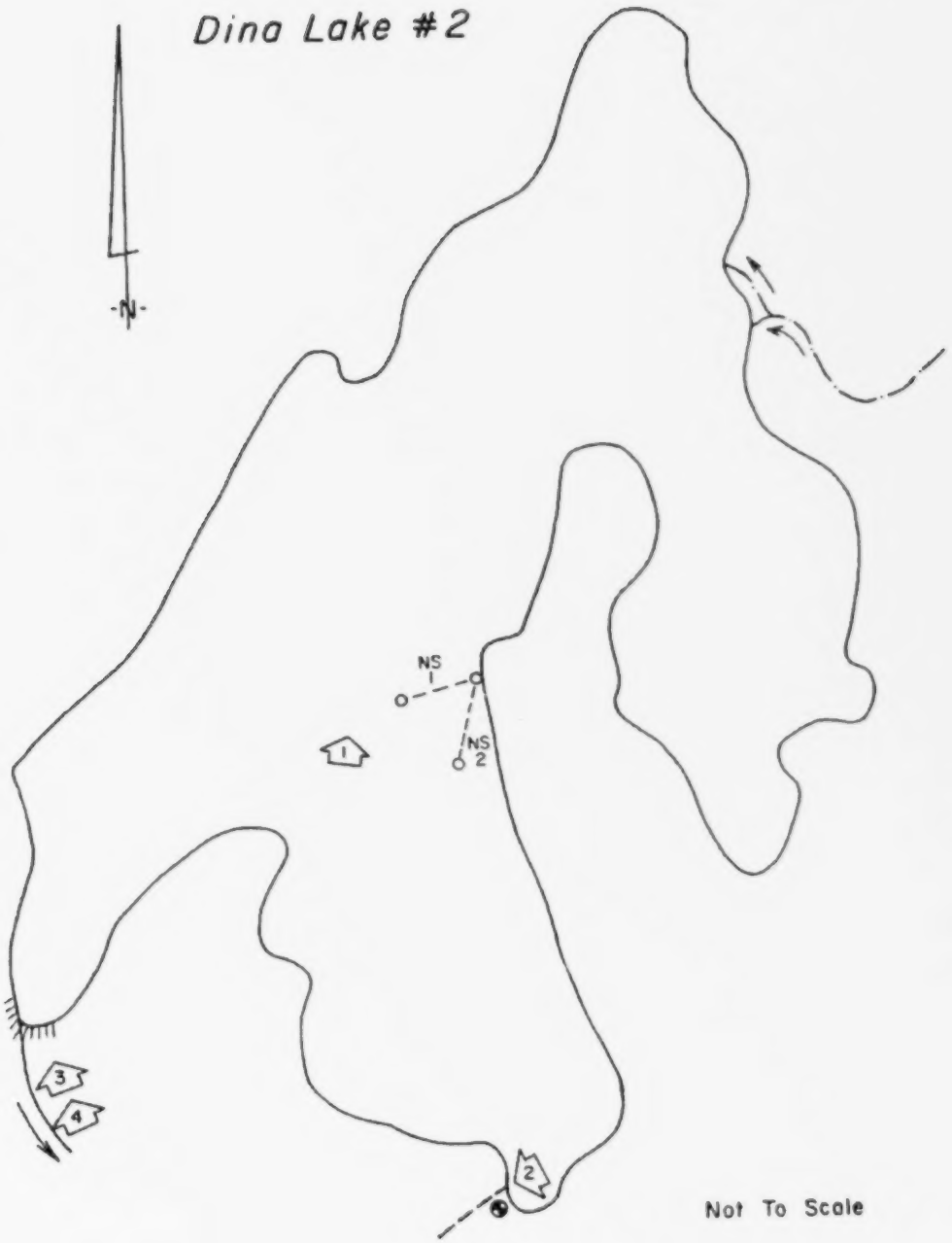

figure 1

Lake: **DINA #2**

RESULTS & DISCUSSIONS

Two overnight net sets yielded 36 brook trout, 1 rainbow trout and 385 longnose sucker (table 2). Two minnow traps yielded 589 lake chub (table 3). Average fork length, weight and condition factor was calculated on the 36 brook trout captured in the overnight net sets (table 4).

TABLE 2
LAKE CATCH SUMMARY

Species	Net Site Number				Angled	Other	Total	Number Sampled	Size Range (cm)
	1	2	3	4					
brook trout	6	30			1		37	36	10.6 - 34.2
rainbow trout		1					1		32.2
longnose sucker	118	267					385		10.8 - 33.2

TABLE 3
MINNOW TRAP CATCH

#	Hours	Depth (m)	Substrate	Species	Size Range (cm)
1	25.50	0.9	fines	263 lake chub 1 longnose sucker	4.6 - 6.7 8.0 - 9.5
2	25.50	0.9	fines/organics	326 lake chub 14 longnose sucker	4.6 - 6.7 8.0 - 9.5

Bait: Sardines

TABLE 4
AVERAGE LENGTH, WEIGHT AND CONDITION FACTOR

Brook Trout	Fork Length (cm)	Weight (grams)	Condition Factor
Number	36	36	36
Mean	22.7	228.6	1.26
Std	7.5	155.8	0.13
Min	10.6	60	0.97
Max	34.2	520	1.5
		Condition Factor Formula:	k = (W(grms) x 100)/L(cms)3

Lake: **DINA #2**

Length vs Age

An indication of growth rate is provided through the length/age relationship of 27 of the brook trout captured in the net sets (table 5, figure 2).

TABLE 5
LENGTH/AGE RELATIONSHIP

Species	Age	Sample Size	Mean (cm)	Std. Dev.	Min (cm)	Max (cm)
brook trout	1	7	19.3	1.8	17.6	23.2
brook trout	2	13	26.6	4.2	20.9	32.6
brook trout	3	7	31.2	1.8	28.8	34.2

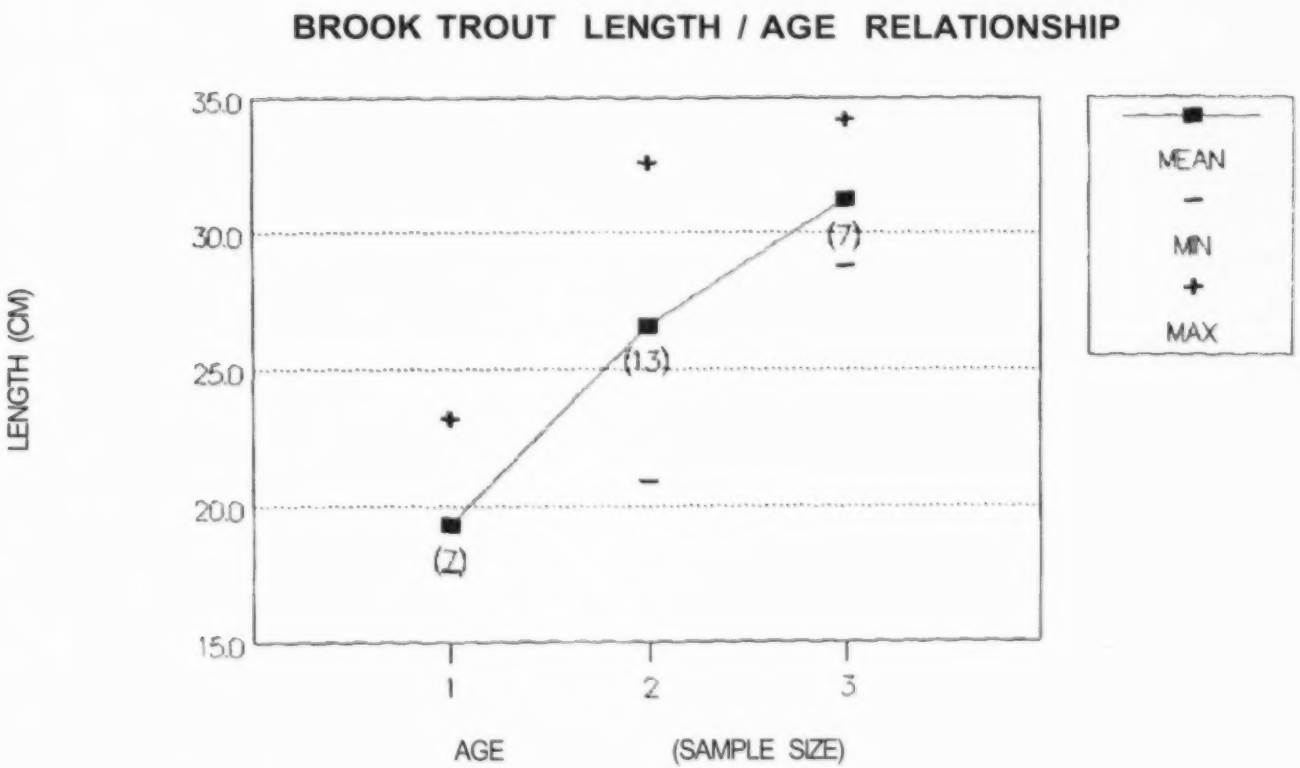

figure 2

Lake: **DINA #2**

BIOLOGICAL ANALYSIS OF BROOK TROUT

Biological analysis was conducted on 29 of the brook trout captured in the net sets. The brook trout captured during the investigation consisted of 9 males, 19 females and 1 unknown. Reproductive organ analysis indicated 15 of the brook trout were maturing and 14 were immature. Stomach contents examination revealed a diet of fish (mainly lake chub) insects (beetles, dragon flies, ladybugs, larvae) and snails. Detritus was noted in 2 of the stomachs and Gammarus was noted in one of the stomachs. The brook trout in Dina Lake #2 appeared healthy. No parasites or diseases were noted in or on any of the examined brook trout. However, black spot disease was noted on some longnose suckers.

DRAINAGE

Unnamed C. - intermittent inlet

This intermittent inlet flows into the north east side of Dina Lake #2. The inlet affords no fisheries potential.

Unnamed C. - outlet (Plate #2, #3)

The outlet drains from the south west end of Dina Lake #2 to Dina Lake #1. Lake level is controlled by a beaver dam (80 cm in height by 30 m in length) located at the lake outlet. A second beaver dam (50 cm in height by 8 m in length) is located 58 m downstream of the lake. A third dam is located 80 m downstream of the lake. Three more dams are located 100 m, 120 m, and 165 m downstream of the lake. Fish passage over these active beaver dams is possible, but difficult at current conditions. All the beaver ponds have a complete organic substrate, affording no spawning habitat but good rearing habitat. The creek has moderate spawning and rearing habitat downstream of the beaver dams. Approx. 400 m downstream from the lake, the outlet had an average wetted width of 2.5 m, average depth of 10 cm, gradient of 1.5% and a water temperature of 12°C.

Lake: **DINA #2**

Length vs Weight

The proportionate upward trend in the length/weight relationship of 27 of the brook trout captured in the net sets is shown in figure 3.

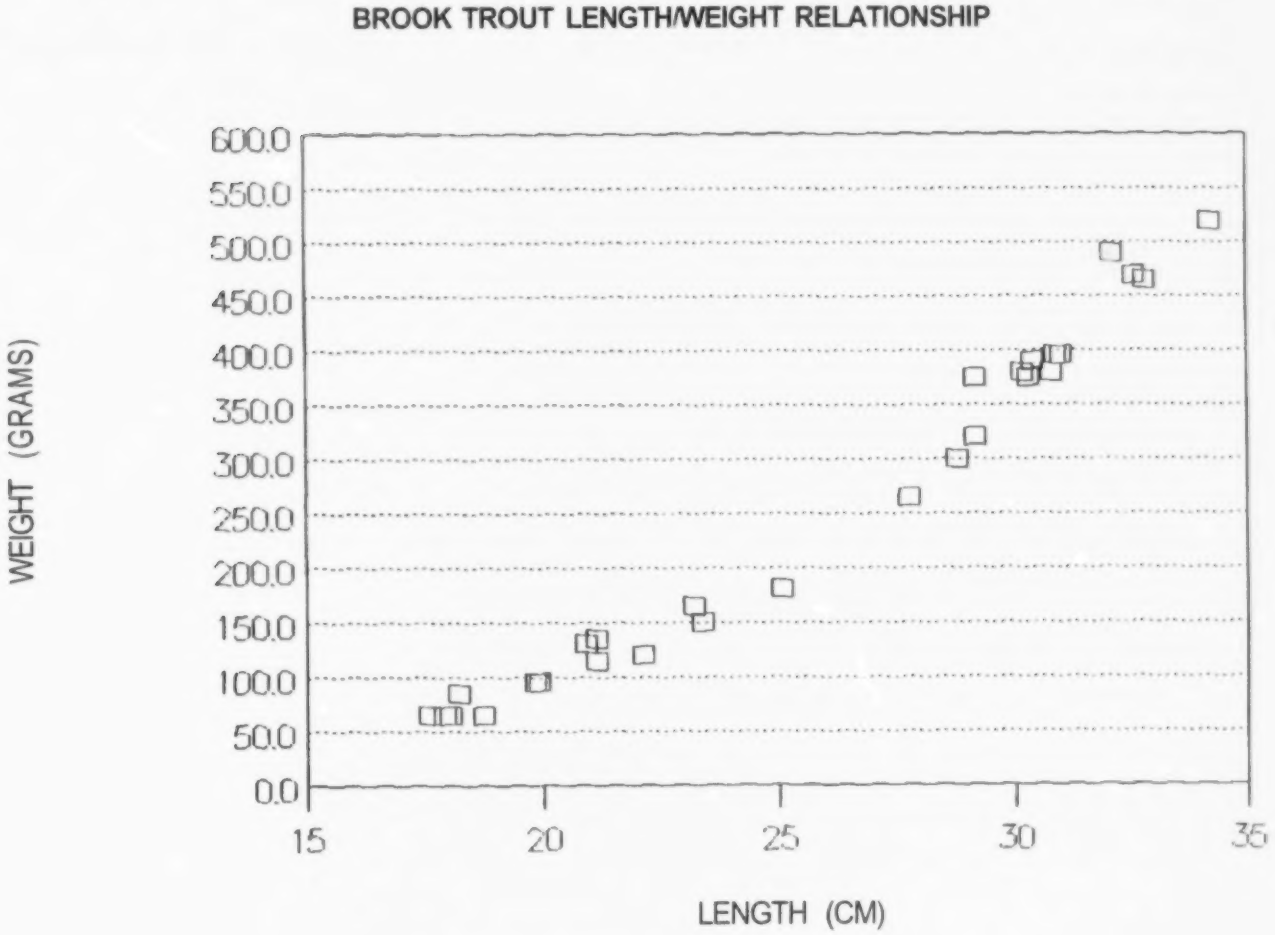

figure 3

Lake: **DINA #2**

Plate 2: View upstream of typical beaver dam on the outlet.

Plate 3: View upstream, taken 165 m downstream of the lake.

Lake: **DINA #2**

ANGLER USE AND CATCH PER UNIT EFFORT

Local anglers and Conservation Officer, Steve Wasylik (Mackenzie) indicated heavy use at Dina Lake #2 during the 1990/91 winter fishery. They indicated that angling success was high but decreased with ice off. Creel information was gathered from our own angling efforts (2 people). Angling catch per unit effort was measured at 1 brook trout per hour.

BENCHMARK

The original benchmark set in 1970 was located (Plate #4). The initial height above water level that the benchmark was set is unknown. The benchmark is located on the south shore, O m from the water's edge in a 30 cm diameter spruce tree which is 2.0 m from the access trail. The benchmark is set 1.66 m above current lake level. The benchmark was re-painted (orange).

MISCELLANEOUS COMMENTS

A management plan encompassing all the Dina Lakes has been produced by D.A. Jesson, Ministry of Environment, Fish and Wildlife Branch, Prince George.

An "engine power restriction" (7.5 kw) has been submitted by B.C. Environment (Prince George) for Dina Lake #2.

Lake: **DINA #2**

Present lake access (Plate #4) is via a steep 50 m trail from the Finlay Forks Forest Development Road.

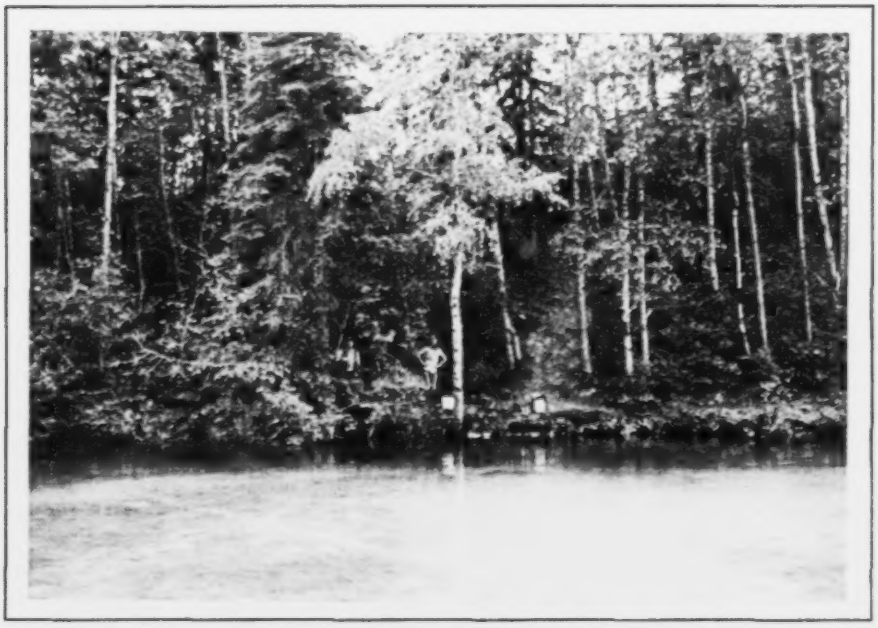

Plate #4: View of steep access trail (50 m). Benchmark is located to the right of A. McLean (red cruiser jacket).

RESORTS AND CAMPSITES

None, however a campsite may be best suited to the relatively low sloping north end (near road).

Lake: **DINA #2**

FISHERIES MANAGEMENT COMMENTS

Dina Lake #2 supports a population of brook trout (stocked) and coarse fish (lake chub, longnose sucker). One rainbow trout, probably originating from Dina Lake #1, was also captured. The brook trout captured during the investigation have a healthy appearance, and appear to be in good condition (C.F. 1.26 (0.97 - 1.50)). Stomach content analysis revealed that brook trout are targeting lake chub and insects as a primary food source. The lake level is controlled by a beaver dam (0.8 m in height) located at the outlet. The outlet flows approx. 830 m from Dina Lake #2 into Dina Lake #1. Moderate spawning habitat is available beyond the initial 165 m of the creek. Rearing habitat is moderate. Brook trout, lake chub and suckers were noted throughout the lake outlet. No brook trout over 3 years of age were captured during the investigation. A total of 10,000 brook trout were stocked in Dina Lake #2 in 1991.

Stocking Program

The current stocking program appears to be successful, however thorough recommendations with regard to this cannot be made until total angler use and C.P.U.E. is assessed. Stocking Dina Lake #2 with the same density, frequency and strain of fish per year until 1995 is recommended. This will significantly improve future stocking program evaluation recommendations. A stocking program evaluation is recommended in 1995.

Enhancement Potential

Enhancement on the outlet will focus on the lower 350 m of the creek (below road crossing) in 1992-93. The report outlining these enhancements is entitled, A Fisheries Evaluation of Dina Lake #1 (on file at the Ministry of Environment, Prince George, B.C.). Enhancements on the initial 200 m of the creek (outlet) may include beaver dam removal and habitat complexing. The feasibility of implementing these enhancements will be reviewed pending the results of the enhancements scheduled for the lower creek.

Lake: DINA #2

APPENDIX 1

Lake: **DINA #2**

NETTING RECORD

Number of panels: 6
Individual panel length: 15.2 m
Mesh sizes experimental order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE #1

Type:	Sinking monofilament		
Date Set:	June 20, 1991	Time:	1220 hrs
Date Lifted:	June 20, 1991	Time:	1820 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth: Substrate:	0.5 m fines
Deep End Mesh Size:	64 mm	Depth: Substrate:	15.0 m organics

Comments:

All brook trout were captured in the 25 and 76 mm mesh sizes (2 panels closest to shore).

NETTING SITE #2

Type:	Sinking monofilament		
Date Set:	June 20, 1991	Time:	1700 hrs
Date Lifted:	June 21, 1991	Time:	1100 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth: Substrate:	0.5 m fines
Deep End Mesh Size:	64 mm	Depth: Substrate:	8.5 m fines/organics

Comments:

Brook trout were captured only in the upper 3.0 m of the water column.

Lake: DINA #2

APPENDIX 2

Lake: **DINA #2**

INDIVIDUAL FISH DATA

Date Captured: June 20, 21 1991

Method of Capture: Sinking monogilament gillnet.

M - Male
F - Female
? - Not Obvious

IMM - Immature
MG - Maturing
MT - Mature
GV - Gravid
SP - Spent
? - Not Obvious

EG - Egg
FR - Fin Ray
HD - Head
ML - Milt
OT - Otolith

SC - Scale
ST - Stomach
TG - Fish Tag
WF - Whole Fish

Species	Fork Length (cm)	Weight (grams)	Sex	Gonadal Maturity	Sample Type	Age	Stomach Contents				Comments
							Plankton	Insects	Fish	Other	
rainbow trout	32.2	395	M	GV	SC	3+		beetles			
brook trout	10.6	–									
brook trout	12.3	–									
brook trout	12.8	–									
brook trout	13.8	–									
brook trout	17.6	66	F	IMM	SC	1+		beetles		snails	
brook trout	17.9	66	F	IMM	SC	1+					
brook trout	18.0	65	F	IMM	SC	–		unidentified insect	1 lake chub		
brook trout	18.2	86	M	IMM	SC	1+			2 longnose suckers		
brook trout	18.2	60									
brook trout	18.6	80									
brook trout	18.7	65	F	MG	SC	1+		beetles			
brook trout	18.8	66									
brook trout	19.8	95	F	IMM	SC	1+		beetle			
brook trout	19.9	96	M	IMM	SC	1+		beetles			
brook trout	20.9	130	F	MG	SC	2+		beetles			
brook trout	21.1	116	F	MG	SC	2+		unidentified insects	unidentified fish	leaf litter	
brook trout	21.1	135	M	IMM	SC	2+			6 lake chub		
brook trout	22.1	120	M	IMM	SC	2+		beetles dragon fly			
brook trout	23.2	165	M	IMM	SC	1			unidentified fish	Gammarus	
brook trout	23.4	150	F	MG	SC	2+			2 lake chub		
brook trout	23.8	170	F	MG	SC	2+			unidentified fish		
brook trout	25.1	180	F	MG	SC	2+		beetle:	2 unidentified fish		
brook trout	27.8	265	M	IMM	SC	2+		lady bug beetles		leaf litter	
brook trout	28.8	300	M	MG	SC	3+					
brook trout	29.2	320	F	MG	SC	2+		larvae		snails	
brook trout	29.2	375	F	IMM	SC	3+					
brook trout	30.2	380	F	MG	SC	2+				snails	
brook trout	30.3	376	F	MG	SC	3+					
brook trout	30.4	390	M	IMM	SC	2+		beetles	unidentified fish		
brook trout	30.8	380	F	MG	SC	2+					
brook trout	30.9	395	F	MG	SC	2+		beetles dragon fly			
brook trout	31.0	395	F	MG	SC	3+					

Lake: **DINA #2**

Species	Fork Lgth (cm)	Wght (a)	Sex	Gonadal maturity	Sample Type	Age (yr)	Stomach Contents				Comments
							Plankton	Insects	Fish	Other	
brook trout	30.9	395	F	MG	SC	2+		beetles dragon fly			
brook trout	31.0	395	F	MG	SC	3+					
brook trout	32.1	490	F	MG	SC	3+					
brooktrout	32.6	470	M	IMM	SC	2+					
brook trout	32.8	465	F	MG	SC	3+		beetles	1 longnose sucker		
brook trout	34.2	520	F	IMM	SC	3+			1 lake chub 1 unidentified fish		

AGE DETERMINATION COMPLETED BY:
Margaret Macdonald, Box 243, Midway, B.C.

AGE DETERMINATION VERIFIED BY:
Arne Langston, Peace Fisheries Compensation Program, Prince George, B.C.